

**U.S. PATENT APPLICATION**

**for**

**CONTAINER SYSTEM**

# **CONTAINER SYSTEM**

## **FIELD OF THE INVENTION**

**[0001]** The present invention relates to a container system. The present invention also relates to a container for pivoting from a closed position to an opened position. The present invention also relates to a make-up case or a cosmetic compact configured for automatic opening to a usable position.

## **CROSS-REFERENCE TO RELATED APPLICATIONS**

**[0002]** This application claims priority to U.S. Provisional Patent Application No. 60/251,891 titled "AN IMPROVED COSMETIC CONTAINER" filed December 7, 2000.

**[0003]** The following patents and/or patent applications are hereby incorporated by reference: U.S. Provisional Patent Application No. 60/251,891 titled "AN IMPROVED COSMETIC CONTAINER" filed December 7, 2000.

## **BACKGROUND**

**[0004]** It is known to provide a cosmetic container having a bottom for retaining a cosmetic substance and a top for retaining a mirror. The top and the bottom of such known cosmetic container are typically fastened together in a closed position by a latch. However, such known cosmetic container is disadvantageous because a user or assembly filler must actuate the latch and manually draw the top apart from the bottom to gain access to the cosmetic substances, mirror or other contents. Such manual drawing apart of such container during filling may cause abrasions (e.g. scratches) or may unintentionally reposition the container, which may cause

an assembly line to jam, glue to be applied on the wrong surfaces, or cosmetic substances to be poured or placed in the wrong location.

**[0005]** Accordingly, it would be advantageous to provide for a container system for automatic pivoting from a closed position to an opened or useable position. It would also be advantageous to provide for a container system in which activation of a user interface automatically positions the cover to a viewing position relative to the base of the container. It would also be advantageous to provide for a container system that permits quick and easy separation of the cover from the base without having to hold or reposition the container. It would also be advantageous to provide for a method for assembling a container.

**[0006]** It would be desirable to provide a system having any one or more of these or other advantageous features.

## **SUMMARY OF THE INVENTION**

**[0007]** The present invention relates to a container for holding cosmetics and having a cover and a base. The container includes a hinge having a spring and coupling the cover to the base and configured for pivoting the cover from a closed position to an opened position relative to the base. The spring is in a tensioned configuration when the cover is in the closed position and the spring is in an at least partially relaxed configuration when the cover is in the opened position.

**[0008]** The present invention also relates to a container for holding cosmetics and having a cover and a base. The container includes a hinge having a spring and coupling the cover to the base and configured for pivoting the cover from a storage position to a use position relative to the base. The container also includes a damper coupled to the hinge and configured to limit pivoting of the cover relative to the base at rate of about 60 to 120 degrees per second. The spring is in a tensioned configuration when the cover is in the closed position and the spring is in an at least partially relaxed configuration when the cover is in the opened position.

**[0009]** The present invention also relates to a method for assembling a container for holding cosmetics. The container includes a cover and a base. The container also includes a hinge assembly having a spring and coupling the cover to the base. The hinge assembly is configured for pivoting the cover from a closed position to a threshold opened position relative to the base. The method includes coupling the cover to the base so that the spring is unloaded. The method also includes pivoting the cover toward the base to a position less than the threshold opened position, thereby loading the spring. The spring is in a tensioned configuration when the cover is in the closed position and the spring is in an at least partially relaxed configuration when the cover is in the threshold opened position.

**[0010]** The present invention also relates to a container for holding cosmetics and having a first platform and a second platform. The container includes a hinge means for coupling the first platform and a second platform and for automatically pivoting the first platform from a storage position to a use position relative to the second platform. The container also includes a damper means for limiting pivoting of the cover at rate of about 60 to 120 degrees per second. The first platform in the storage position conceals the cosmetics and the first platform in the use position reveals the cosmetics.

## FIGURES

**[0011]** FIGURE 1A is a perspective view of a container system in a closed position according to an exemplary embodiment.

**[0012]** FIGURE 1B is a perspective view of the container system of FIGURE 1 in an opened position.

**[0013]** FIGURE 2 is an exploded perspective view of the container system of FIGURE 1.

**[0014]** FIGURE 3A is a fragmentary cross-sectional view of the container system of FIGURE 1A along line 3A—3A of FIGURE 1A.

**[0015]** FIGURE 3B is a cross-sectional view of the container system of FIGURE 1A along line 3B—3B of FIGURE 1B.

**[0016]** FIGURE 4 is a sectional view of a container system in a closed position according to an alternative embodiment.

**[0017]** FIGURE 5 is a cross-sectional view of the container system of FIGURE 1A along line 5—5 of FIGURE 1B.

**[0018]** FIGURE 6A is a perspective view of a container system in an opened position showing a section of a mounting interface according to an alternative embodiment

**[0019]** FIGURE 6B is a cross-sectional view of the container system of FIGURE 6A along line 6B—6B of FIGURE 6A.

**[0020]** FIGURES 7A through 7C are side elevation views of the container system of FIGURE 1 showing a progression for the assembly of the container system according to an exemplary embodiment.

#### **DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS**

**[0021]** Referring to FIGURES 1A and 1B, a container system or cosmetic compact 10 is shown in a closed position. Compact 10 includes a cover 12 attached to a platform or base 14 by a hinge assembly 40a. Activation of a user interface or button 30 releases a lock 32 and permits cover 12 to automatically pivot from storage or closed position 16 (see FIGURE 1A) to a use or opened position 18 and relative to base 14 for presentation or viewing of a display or mirror 96 and for access to contents (see FIGURE 1B).

**[0022]** Referring to FIGURE 2, a damper assembly 50 permits the pivoting motion to proceed at a relatively slow rate (e.g. “soft” ejection or drawing open of the cover relative to the base). The pivoting motion smoothly moves the cover from closed position 16 to opened position 18, and inhibits the cover from quickly “popping” open when lock 32 is unlocked. According to an exemplary embodiment, the opened position includes the cover pivoted less than about 360 degrees, suitably less than about 180 degrees, more

suitably less than about 120 degrees, preferably greater than about 90 degrees relative to the base. According to an exemplary embodiment, the cover moves from the closed position to the opened position at a rate of about 0.2 to 10 seconds, suitably 0.3 to 7 seconds, more suitably 0.4 to 5 seconds. According to another exemplary embodiment, the cover moves from the closed position to the opened position at a rate of about 10 to 200 degrees per second, suitably 15 to 150 degrees per second.

**[0023]** The attachment of cover 12 to base 14 by hinge assembly 40a is shown in FIGURE 2. Base 14 includes cavities 94a and 94b for retaining accessories such as pressed powder, eye shadow, cosmetic applicators, etc. Cover 12 also includes an accessory (shown as mirror 96). Base 14 includes an end tab 22a and an end tab 22b located toward the rear of base 14 opposite user interface 30. End tabs 22a and 22b are connected to the ends of a cover hub 42 having a mounting interface 44a and mounting interface 44b, respectively. A grommet or plug 60 of damper assembly 50 is inserted into end tab 22a and mounting interface 44a to maintain the attachment of cover 12 to base 14 (see FIGURE 3A). Plug 60 is attached to end tab 22a by a keyed or snap-fit fastener, and may be attached by any suitable mechanical or other fastener such as a pin, heat staking, welding, spin welding, etc.

**[0024]** A fastener (shown as a pin 98) is inserted through an aperture of end tab 22b and at least partially within mounting interface 44b, to provide supplemental attachment of cover 12 to base 14. According to an alternative embodiment, a ball and socket or barrel and claw may be used to provide a supplemental attachment of the cover to the base.

**[0025]** Mounting interface 44a provides a housing or cylindrical sleeve 46 having a cavity 56 for retaining a spring 70 and at least a portion of plug 60. Referring to FIGURE 3A, one end of spring 70 is shown attached to an end wall 54 of sleeve 46 by a fastener 102. The other end of spring 70 is shown attached to plug 60 of damper assembly 50. The position

of plug 60 is fixed by end tab 22a of base 14. As shown in the FIGURES, cavity 56, plug 60 and spring 70 are coaxial.

**[0026]** When cover 12 is pivoted or moved from closed position 16 (see FIGURE 3A) to opened position 18 (see FIGURE 3B) plug 60 does not substantially pivot, so the end of spring 70 attached to plug 60 does not substantially pivot; and sleeve 46 pivots with cover 12, so the end of spring 70 attached to sleeve 46 pivots and sleeve 46 frictionally engages and rotates around plug 60. The attachment of spring 70 to wall 54 of sleeve 46 and to plug 60 is shown in FIGURES 3A and 3B. FIGURE 3A shows spring 70 in a wound or tightened position. Compare FIGURE 3A showing torque applied on spring 70 and having a relatively small radius with FIGURE 3B showing spring 70 at least partially relaxed, having a relatively large radius, and having fewer coils or windings. (See the position of the coils of the spring in FIGURE 3A relative to the position of the coils of the spring in FIGURE 3B.) As cover 12 is pivoted to opened position 18, spring 70 unwinds to a semi-relaxed position (see FIGURE 3B). Without intending to be limited to any particular theory, it is believed that the unwinding first occurs near wall 54 of sleeve 46.

**[0027]** A hinge assembly 40b is shown in FIGURE 4 according to an alternative embodiment. Hinge assembly 40b is different from hinge assembly 40a in at least one respect: a cartridge assembly 58 encapsulates spring 70. Other than this modification, the construction and performance of hinge assembly 40a is substantially the same to that of hinge assembly 40b, and like reference numerals are used to identify like elements. Cartridge 58 provides for easy handling and quick replacement. A fastener 104 attaches spring 70 to cartridge 58, and a fastener (shown as a rib 108 inserted in a slot) attaches sleeve 46 to cartridge 58 so that cartridge 58 is "keyed" or attached to cover 12. As spring 70 unwinds, cartridge 58 rotates with sleeve 46 and cover 12 pivots to opened position 18 (i.e. the cover is rotationally impelled by the unwinding of the spring). Cartridge 58 also rotates about plug 60, which is fixed by a fastener 106 to end tab 22a of base 14.

**[0028]** As shown in FIGURE 4, damper assembly 50 includes two nested, concentric cylinders (i.e. plug 60 and cartridge assembly 58) separated by a thin layer of relatively high viscosity fluid (such as grease). The fluid fills any gap between the nested cylinders and assists in resisting (in shear) the opening force of the cover (i.e. coaxial relative rotation of the nested cylinders). Without intending to be limited to any particular theory, it is believed that the friction between the fluid and the nested cylinders (or plug 60 and cartridge assembly 58 as shown in FIGURE 3A) resists the opening force of spring 70 and cover 12 and serves to "dampen" the spring force.

**[0029]** According to a preferred embodiment, the fluid is stiff grease. According to an alternative embodiment, the fluid is silicone grease. According to an alternative embodiment the grease is in the form of a cylindrical tube. According to another alternative embodiment the ratio of the spring diameter to the grease cylinder is between about 0.5 and 1.5. According to another alternative embodiment, the inner cylinder and the outer cylinder of the nested cylinders have a length to diameter ratio of at least about 1, suitably at least 2, more suitably at least 3, most suitably at least 4.

**[0030]** According to a preferred embodiment as shown in FIGURE 2, the spring is a coiled wire spring. When loaded, the spring stores energy (i.e. in a tightly wound or tensioned configuration) for automatically opening cover 12 when lock 32 is unlocked. When lock 32 is unlocked, spring 70 untwists about its longitudinal axis to a partially unwound or semi-relaxed configuration (e.g. the spring recovers to its basic or slightly tensioned position). According to alternative embodiments, the spring may be a bias, torsion, coil, compression, tension, leaf, etc. type of spring.

**[0031]** Referring to FIGURE 5, a stop action mechanism 80a for rotationally constraining cover 12 and to prevent cover 12 from opening more than a predetermined position is shown. Mechanism 80a includes a tab or lip 82 protruding from cover 12. The pivotal or angular movement of cover 12 relative to base 14 is limited by the engagement of lip 82 with base 14. According to an alternative embodiment, the lip may engage the base at a



variety of "indexed" or predetermined positions for adjusting the position of the cover. For example, the tab may engage the cover only after the cover has pivoted at least 180 degrees relative to the base so that the base can be supported or inclined on a work surface (e.g. desk) by the cover.

**[0032]** Referring to FIGURES 6A and 6B, a stop action mechanism 80b is shown according to an alternative embodiment. Stop action mechanism 80b includes a cam or bushing 84 of cover 12 for movement within a slot or arcuate track 86 of base 14. In closed position 16 of cover 12 in which the contents are concealed, bushing 84 abuts against a lower surface 88 of track 86. As cover 12 is moved to opened position 18 in which the contents are revealed, bushing 84 follows the path of track 86. In opened position 18 of cover 12, movement of bushing 84 (and cover 12) is limited by an upper surface 92 of track 86. According to an alternative embodiment, a series of teeth or interference bumps may be provided along the track. A tactile force may be applied to overcome the stopping action of the teeth, such that the cover may be opened along an indexed range of motion relative to the base.

**[0033]** Lock 32 retains cover 12 in closed position 16 against an opening spring force applied by spring 70. User interface 30 is selectively engaged to unlock lock 32 and thereby automatically (e.g. "hands free" manner) release cover 12 from closed position 16 to opened position 18. Lock 32 includes a tab 34 for latching to (or underneath) a lip or ridge 36 (see FIGURE 2). The lock may include a releasable spring clip to selectively engage/disengage the tab from the ridge. According to an alternative embodiment, the latch is coupled to an interengaging surface to flex out of engagement with another interengaging surface when the latch is depressed in a direction substantially inward toward the relative rotational axis of the cover, or according to another alternative embodiment, in a direction substantially perpendicular to the relative rotational axis of the cover.

**[0034]** Referring to FIGURE 2, container 12 may be assembled as follows. Spring 70 is inserted into sleeve 46. One end of

spring 70 is attached to wall 54 of sleeve 46. Spring 70 in a relaxed condition (i.e. under little or no load) is "plunged" or compressed by plug 60. Cover 12 is attached to base 14 by press fit of plug 60 into end tab 22a of base 14 and insertion of pin 98 through end tab 22b and mounting interface 44b.

**[0035]** Referring to FIGURES 7A through 7C, cover 12 is attached to base 14 such that cover 12 is pivoted beyond predetermined or maximum threshold opened position 18 (e.g. cover 12 is at an angle  $\alpha$  about 160 degrees relative to base 14) as shown in FIGURE 7A. Spring 70 is "loaded" by pivoting cover 12 past stop action mechanism 80a to opened position 18 at an angle  $\beta$  as shown in FIGURE 7B. Cover 12 is then pivoted to closed position 16 (as shown in FIGURE 7C) and maintained in closed position 16 by lock 32. Accessories may be attached to the cover and the base (e.g. a mirror may be attached to the cover by an adhesive, a preformed solid lozenge or disk may be fixed in the base, a cosmetic liquid or solid may be filled in the cavities of the base, etc.).

**[0036]** Although only a few embodiments of the present inventions have been described in detail in this disclosure, those skilled in the art who review this disclosure will readily appreciate that many modifications are possible (e.g. variations in sizes, dimensions, structures, shapes and proportions of the various elements, values of parameters, mounting arrangements, use of materials, colors, orientations, protocols, etc.) without materially departing from the novel teachings and advantages of the subject matter recited in the claims. For example, the hinge assembly may be provided in the base rather than in the cover. The "footprint" or shape of the cover and the base may be rectangular or square, round or oval, or any other shape. The cover and the base may be provided as multiple pieces. The container may include a supplemental platform (e.g. a three tiered configuration for wet-dry applications). Accordingly, all such modifications are intended to be included within the scope of the present invention as defined in the appended claims. The order or sequence of any process or method steps may be varied or re-sequenced according to alternative embodiments. In the

claims, any means-plus-function clause is intended to cover the structures described herein as performing the recited function and not only structural equivalents but also equivalent structures. Other substitutions, modifications, changes and omissions may be made in the design, operating conditions and arrangement of the preferred and other exemplary embodiments without departing from the spirit of the present inventions as expressed in the appended claims.